

(12) UK Patent Application (19) GB (11) 2 261 500 (13) A

(43) Date of A publication 19.05.1993

(21) Application No 9124260.2

(22) Date of filing 15.11.1991

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(51) INT CL⁵
B08B 15/02

(52) UK CL (Edition L)
F4V VGAC V142

(56) Documents cited
None

(58) Field of search
**UK CL (Edition K) F4V VFD VFX VGAA VGAC
INT CL⁵ B08B 15/00 15/02 15/04**

(54) Clean rooms for dispensing powdered substances

(57) An enclosure (30) for dispensing powdered substances comprises a ceiling (31) comprising means for creating a downward flow of air, filter means (32) at the foot of wall (33), and a work station (34) having a perforate barrier (35) which is positioned substantially parallel to the wall (33). The barrier extends upwardly from the floor of the enclosure to a height which is approximately waist or chest high relative to an operator. The barrier (35) prevents an operator from bending over containers for the powdered substances which containers are located between barrier (35) and wall (33).

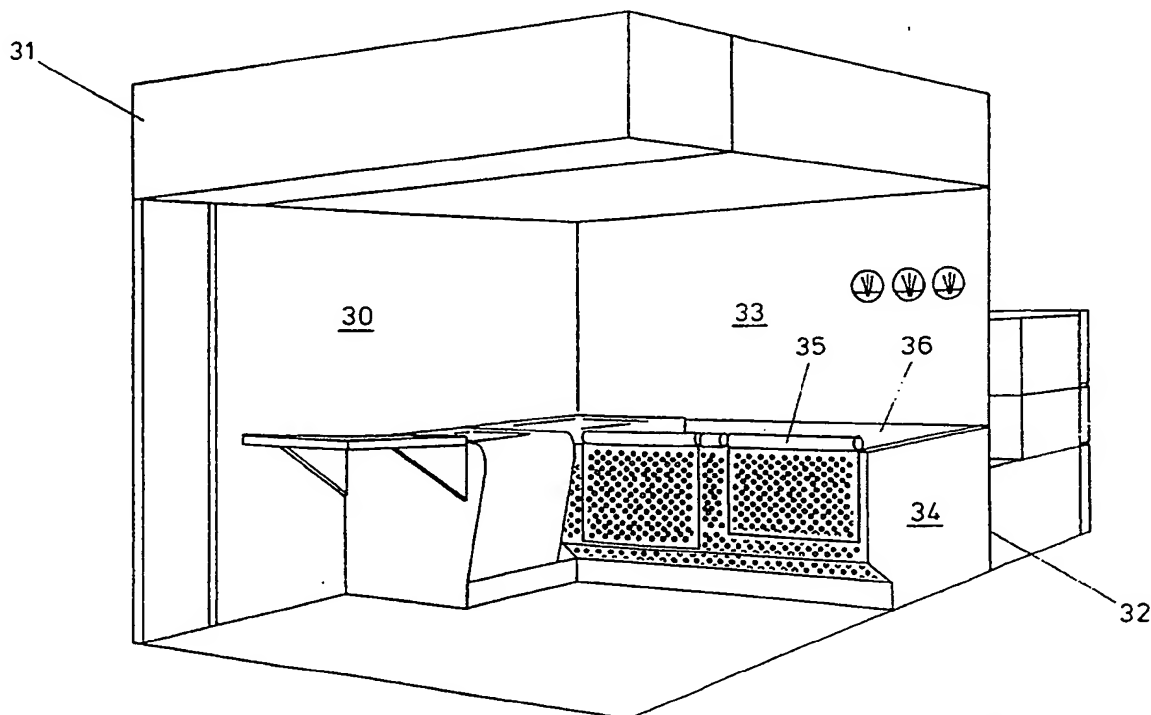


FIG. 3

At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

The claims were filed later than the filing date within the period prescribed by Rule 25(1) of the Patents Rules 1990.

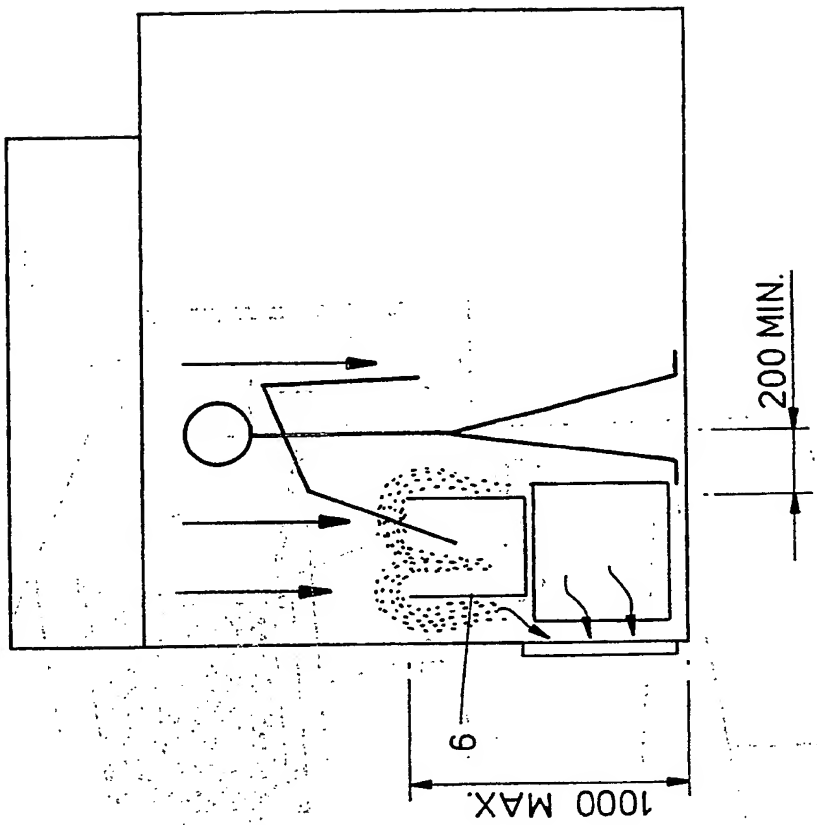


FIG. 2

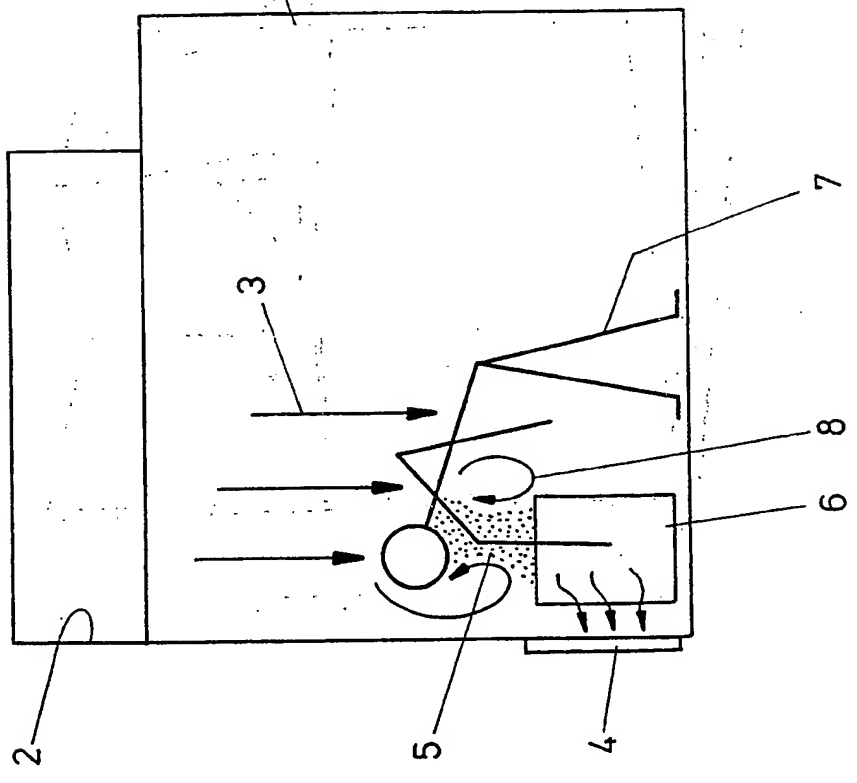


FIG. 1

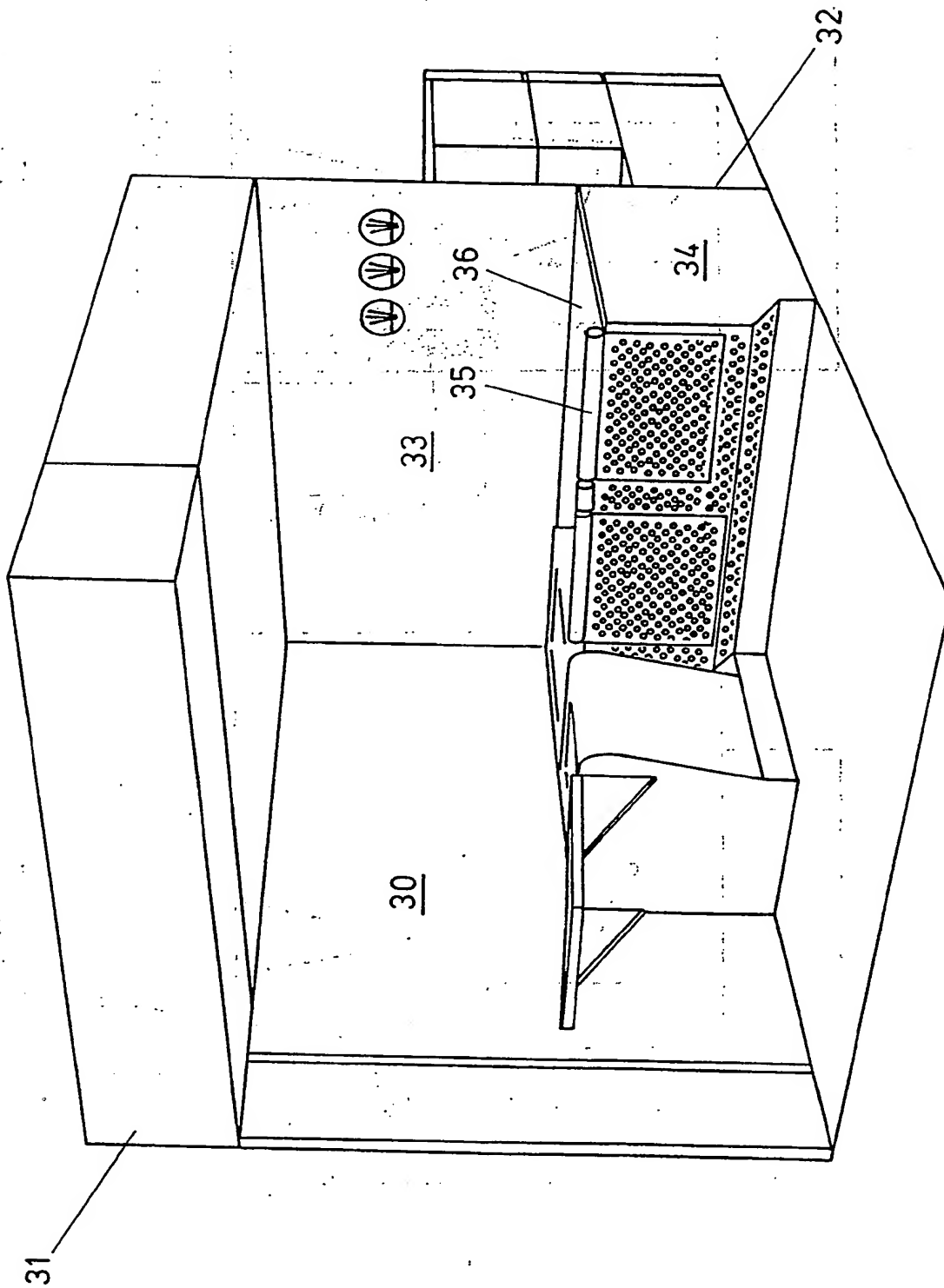


FIG. 3

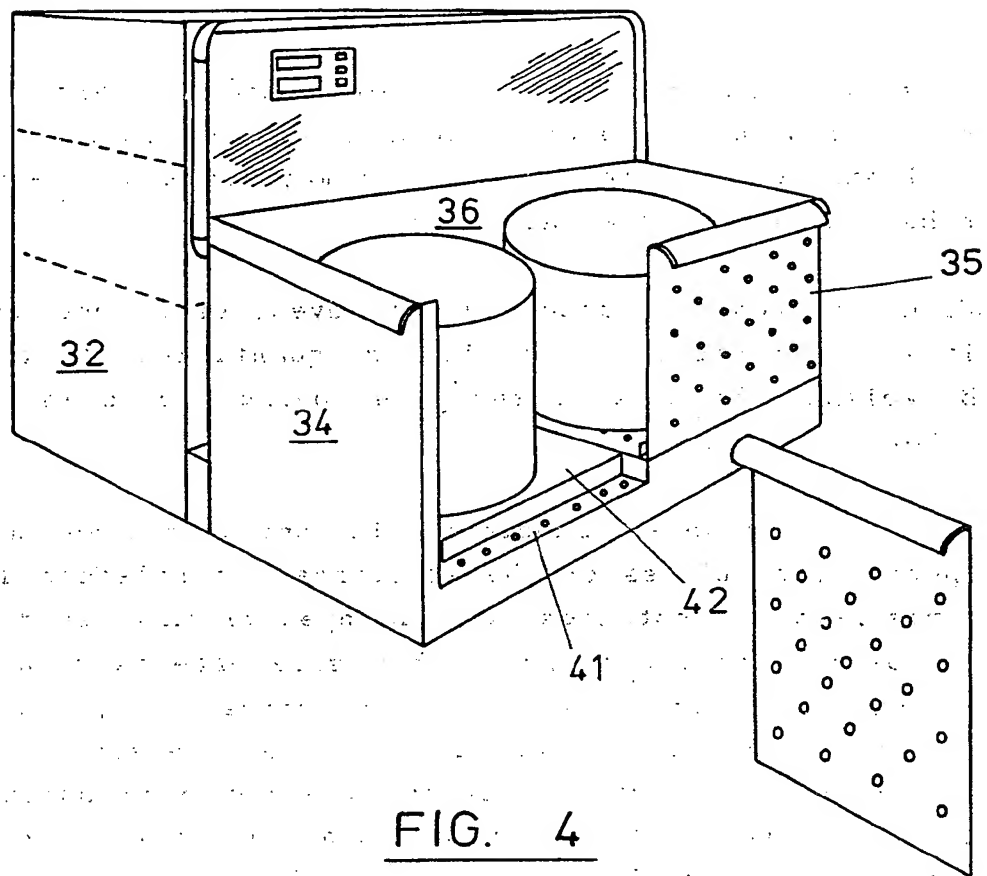


FIG. 4

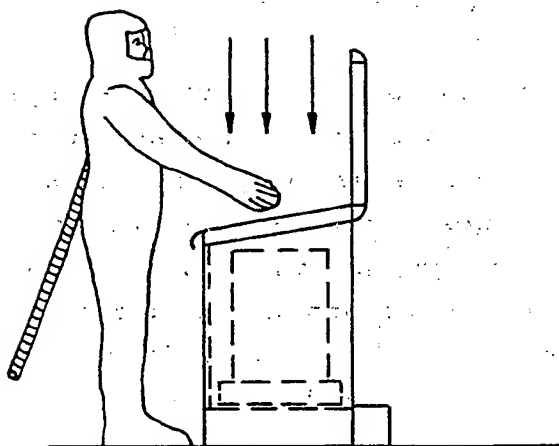


FIG. 5

ENCLOSURE

This invention relates to an enclosure in which powdered substances such as dyes or drugs may be dispensed, and to a work station at which an operator may dispense the powdered substance within the enclosure.

With powdered substances such as dyes, drugs and the like, it is often necessary to dispense quantities of the powder by weight, the bulk of the powder being stored in a bin or other container.

When the powdered substance is being dispensed by an operator, particles of the substance are released into the atmosphere. Substances such as dyes or medical drugs may be noxious, or cause undesirable side effects when inhaled by the operator. Thus the presence of particles of substance create a hazard for the operator. It is therefore necessary to dispense the powdered substance in an enclosure having suction and filtering facilities, whereby the particles of powdered substance are continually removed from the air within the enclosure.

A known enclosure defines a substantially cuboidal space in which an operator may dispense a powdered substance. Typically, the powdered substance is dispensed from a bin or other container which is positioned on the floor in the enclosure. Typically, the height of the bin extends to a height somewhere between the operators knees and waist. A downward flow of air is produced by means positioned in the ceiling of the enclosure, which air is pulled out of the enclosure by extraction means positioned towards the floor of the enclosure. Generally, the extraction means are positioned close to the bin containing the powdered

substance.

Enclosures of this type have been in use for some time, and it has generally been thought that the enclosures provide adequate protection to the operator.

As the level of substance in the bin becomes lower, the operator dispensing the substance in the known enclosure will have to bend progressively lower in order to reach the substance to be dispensed. Not only is this ergonomically undesirable, it also results in the operator's face becoming progressively closer to the substance being dispensed.

According to the invention, there is provided an enclosure for the dispensing of substances comprising:
means for causing downward flow of air within the enclosure;
filtration means positioned towards the bottom of a wall of the enclosure to remove particles of the substance being dispensed from the said air,
characterised in that the enclosure further comprises a workstation positioned towards the wall containing the filtration means at which a powdered substance may be dispensed by an operator, the workstation comprising: a barrier positioned substantially parallel to the wall containing the filter means, and defining a space between the barrier and the wall in which a container may be positioned.

The space between the wall and the barrier is adapted to contain one or more bins or other containers containing the substance to be dispensed.

The presence of the barrier makes it difficult, if not impossible for an operator who is dispensing the material

to bend over the bin. The barrier is typically placed at a height which is approximately chest height relative to the height of the operator.

In the known enclosure described previously, the situation where the operator had to bend over the bin was thought not to be disadvantageous. It had been realised that, to a certain extent, the position of the operator's head over the bin blocked the downward flow of air slightly in that area of an enclosure.

However, the applicants have made the surprising discovery that not only does the position of the operators' head reduce the effect of downward air flow in the vicinity of the bin, it actually results in an upward air flow in this area. This upward air flow causes particles of the substance in the bin to be blown directly into the operator's face and thus increases the amount of substance inhaled by the operator.

The presence of the barrier in the enclosure according to the present invention thus significantly reduces the amount of powdered substance being inhaled by the operator.

It has been found that the optimum height for the barrier both ergonomically and from the point of view of reducing the possibility of an operator managing to bend over the bin, is approximately chest height relative to the operator.

The barrier may contain a single substantially horizontal bar, but preferably it comprises a gate extending from the floor of the enclosure to an appropriate height above the floor.

Advantageously, the gate is formed from a perforated

material.

The presence of a gate formed from a perforated material improves the downward air flow over the dispensing area.

Thus, in addition to significantly reducing upward air flow in the vicinity of the operator's face, by preventing an operator bending over the bin, the gate also enhances the downward air flow by channelling air in a downward direction in the vicinity of the bin.

Preferably the gate is made from a metal.

Advantageously, the workstation further comprises a raised platform on which a bin or other container may be positioned behind the barrier.

The presence of the platform enables the bin or other container to be positioned at an appropriate height relative to the barrier. Generally, the bin will be positioned such that its top end is just below the level of the barrier.

The invention will now be described by way of example only with reference to the accompanying drawings, in which:

Figure 1 is a schematic diagram showing the air flow produced in a known enclosure;

Figure 2 is a schematic diagram showing the improved air flow in an enclosure according to the present invention;

Figure 3 is a more detailed diagram of an enclosure according to the present invention;

Figure 4 is a more detailed diagram of the workstation

forming part of the enclosure according to the present invention: and

Figure 5 is a side view of the workstation of Figure 4.

Referring to Figure 1, a known enclosure 1 is shown. The enclosure comprises means 2 in the ceiling of the enclosure 1 for creating a downward air flow as indicated by arrows 3. The enclosure 1 further comprises filter means 4 positioned towards the bottom of the enclosure for drawing out the air which now contains particles of powdered substance 5. The powdered substance is contained in a bin 6 and is dispensed by an operator 7. During the dispensing of the powdered substance 5, the operator bends over the bin as shown in the figure. This results in an upward air flow 8 which actually directs the powdered substance 5 into the face of the operator. This increases the amount of substance inhaled by the operator.

Turning now to Figure 2, the air flow in an enclosure according to the present invention is shown. As can be seen, because the operator is prevented from bending over the bin 6, the downward air flow remains downward throughout the dispensing operation. In addition, the presence of a gate formed from a perforated material results in an enhanced downward air flow in the vicinity of the bin 6. The enclosure of Figure 2 will now be described in more detail with reference to Figure 3.

Referring to Figure 3, an enclosure according to the present invention is designated generally by the reference numeral 30. The enclosure 30 comprises a ceiling 31 containing means (not shown) for creating a downward flow of air. The enclosure 30 also comprises filter means 32 positioned in a wall 33 of the enclosure and towards the bottom of the enclosure 30. In use, air is directed

downwardly by the means in the ceiling 31 and is pulled out of the enclosure by the filtration means 32. The enclosure further comprises a workstation 34 according to the present invention. The workstation comprises a barrier 35 which is positioned substantially parallel to the wall 33. The wall 33 and the barrier 35 serve to define an area 36 in which one or more bins or containers may be positioned. The workstation 34 is shown in more detail in Figure 4. As can be seen from Figure 4, the workstation comprises the barrier 35 which is made from a perforated metal and extends upwardly from the floor of the enclosure to a height which is approximately waist height relative to an operator dispensing the substance. In the example shown in Figure 4, two bins are positioned within the space 36. Each bin may contain a powdered substance which is to be dispensed. The area 36 is defined by wall 33 in which the filter means 32 are positioned and the barrier 35. In this example, the bins are positioned on a slightly raised platform 41 and also a weighing scale 42 which records the current weight of the bin. In use, an operator is prevented from bending over the bins due to the presence of the barrier 35. The downward air flow created by the means in the ceiling of the enclosure remains effective in drawing powdered particles away from the face of the operator. This significantly reduces the amount of the powdered substance being inhaled by the operator. In addition, the presence of the barrier 35, which comprises a gate serves to improve the downward air flow over the bins.

CLAIMS

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1. An enclosure for the dispensing of substances comprising:
means for causing downward flow of air within the enclosure;

filtration means positioned towards the bottom of a wall of the enclosure to remove particles of the substance being dispensed from the said air,
characterised in that the enclosure further comprises a work station towards the wall containing the filtration means, at which a powdered substance may be dispensed by an operator, the work station comprising:

a barrier positioned substantially parallel to the wall containing the filter means, and defining a space between the barrier and the wall in which a container may be positioned.

2. An enclosure according to claim 1 wherein the barrier is positioned approximately at chest height, relative to an operator.

3. An enclosure according to claim 1 or claim 2 wherein the barrier comprises a gate extending from the floor of the enclosure to an appropriate height above the floor.

4. An enclosure according to any one of the preceding claims, wherein the gate is formed from a perforated material.

5. An enclosure according to any one of the preceding claims wherein the gate is made from a metal.

6. An enclosure according to any one of the preceding claims wherein the work station further comprises a raised platform, on which a bin or other container may be positioned behind the barrier.

7. An enclosure substantially as hereinbefore described with reference to the accompanying drawings.

Patents Act 1977
Examiner's report to the Comptroller under
Section 17 (The Search Report)

Application number

GB 9124260.2

Relevant Technical fields

(i) UK Cl (Edition K) F4V (VGAC, VGAA, VFD, VFX)

(ii) Int Cl (Edition 5) B08B 15/00, 15/02, 15/04

Databases (see over)

(i) UK Patent Office

(ii)

Search Examiner

A N BENNETT

Date of Search

17 DECEMBER 1992

Documents considered relevant following a search in respect of claims 1

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
	NONE	

SF2(p)

GEM - doc99\fl1000647

Category	Identity of document and relevant passages	Relevant to claim(s).

Categories of documents

X: Document indicating lack of novelty or of inventive step.

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P: Document published on or after the declared priority date but before the filing date of the present application.

E: Patent document published on or after, but with priority date earlier than, the filing date of the present application.

&: Member of the same patent family, corresponding document.

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